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# Chronic Kidney Disease in the United States

U.S. Department of Health and Human Services

National Institutes of Health

National Institute of Diabetes and Digestive and Kidney Diseases

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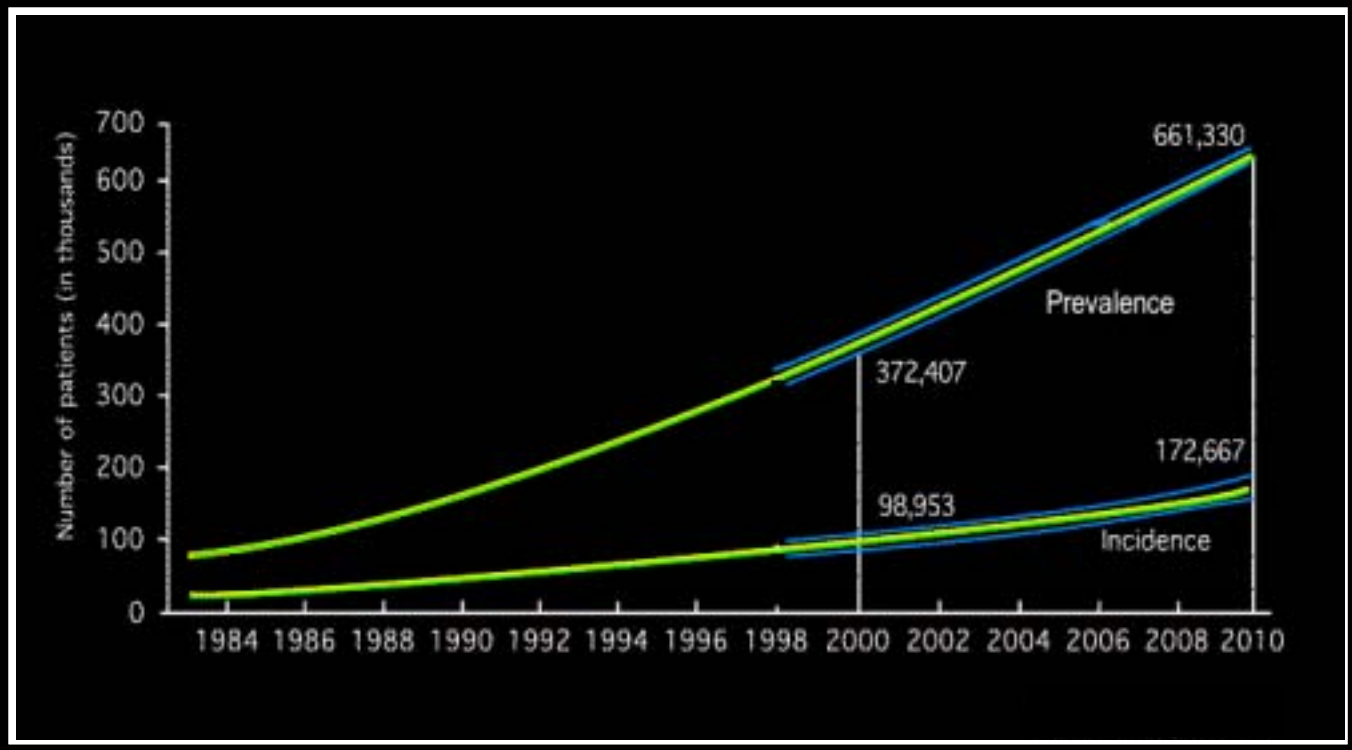
# Reasons for a National Kidney Disease Education Program

1) Kidney failure is a public health problem
2) Economical, effective testing and therapy exist
3) Testing and therapy are inadequately applied

# Kidney Failure is a Rapidly Growing Problem




USRDS, 2000

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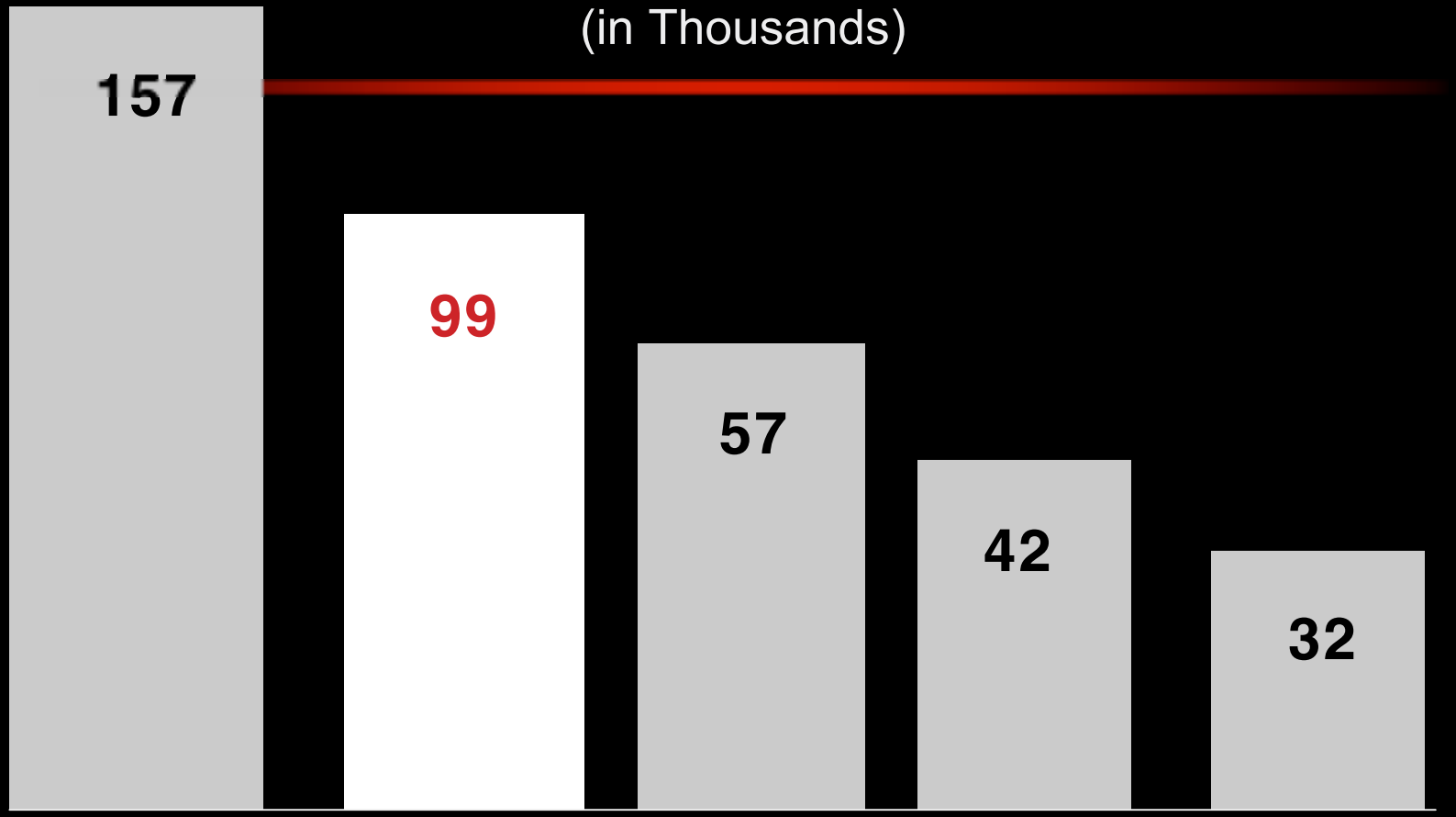
# Kidney Failure Compared to Cancer Deaths in the U.S. in 2000

(in Thousands)




Seer, 2003

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# Prevalence of Renal Insufficiency in U.S.

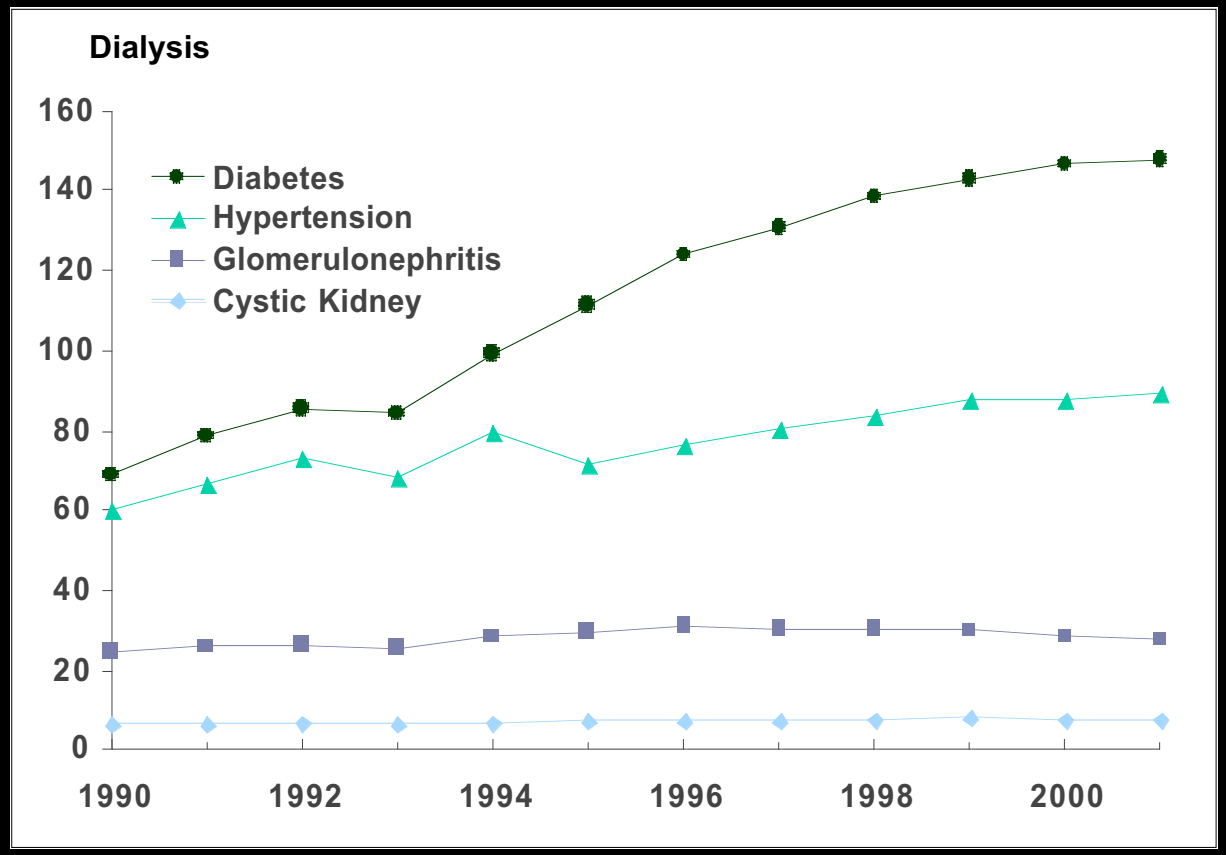
| GFR (mL/min/1.73 $m^2$) | 59-30 | 29-15 | < 15 |
|---|---|---|---|
| Number of People | 7.6 Million | 360,000 | > 300,000 |

**More than 8 million Americans have substantial kidney impairment and 10 million more have albuminuria.**

Coresh, et al., 2003

# Incident Rates by Primary Diagnosis

(per million population, adjusted)




USRDS, 2003

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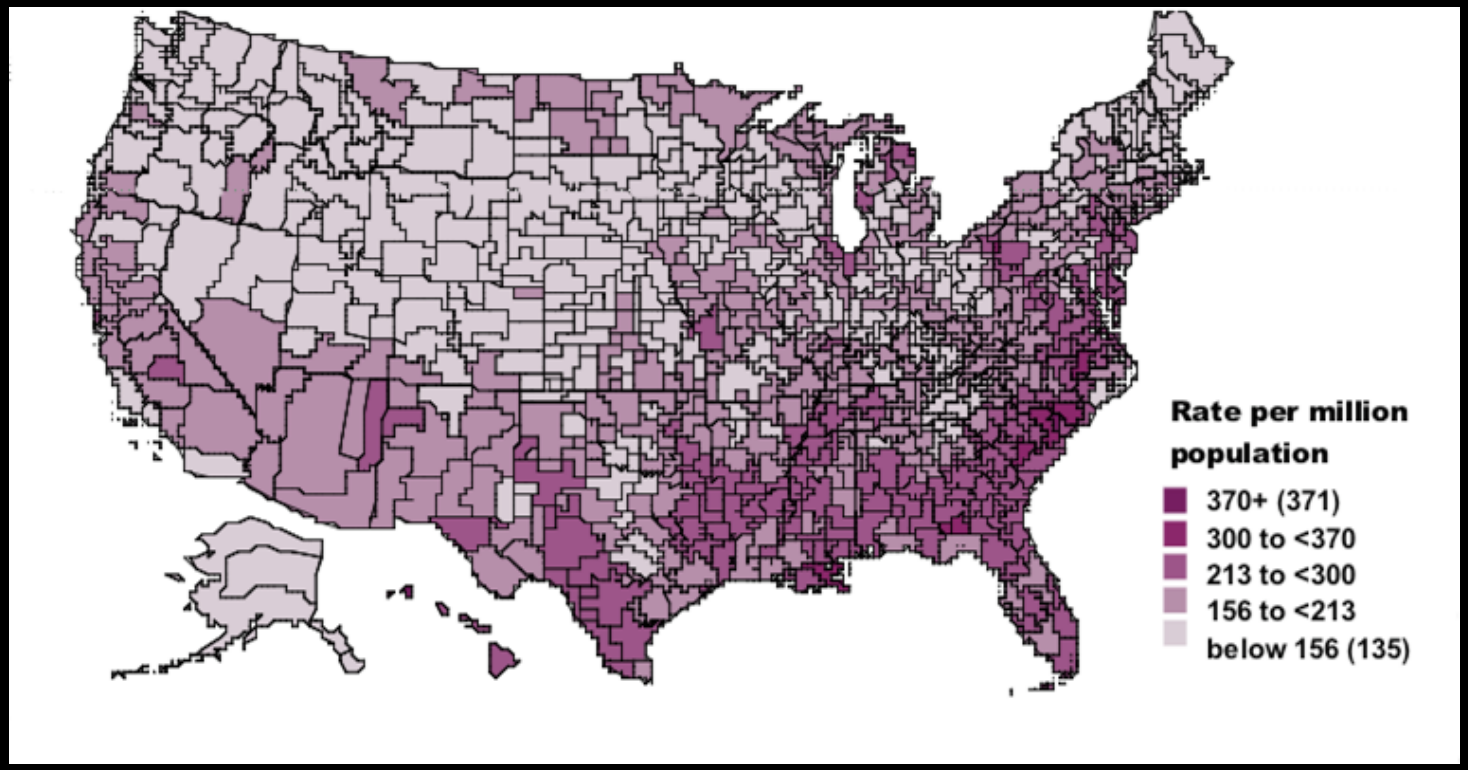
# Incidence of Kidney Failure

(per million population, 1990, by HSA, unadjusted)

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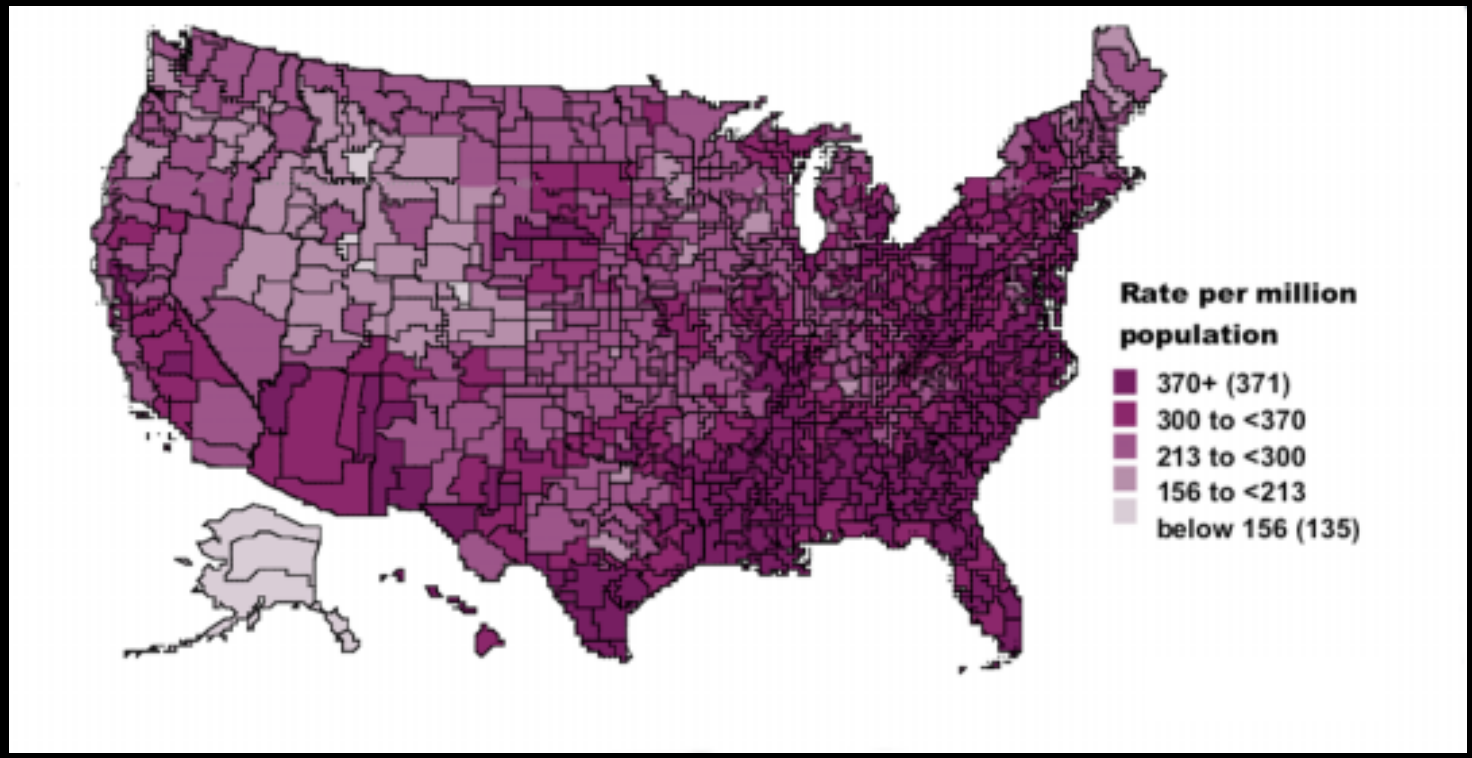
# Incidence of Kidney Failure

(per million population, 2000, by HSA, unadjusted)

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# The Risk of Kidney Failure is Not Uniform

Relative risks compared to Whites:

| | |
|---|---|
| *African Americans* | **3.9 X** |
| *Native Americans* | **2.9 X** |
| *Asians* | **1.6 X** |

USRDS, 2003

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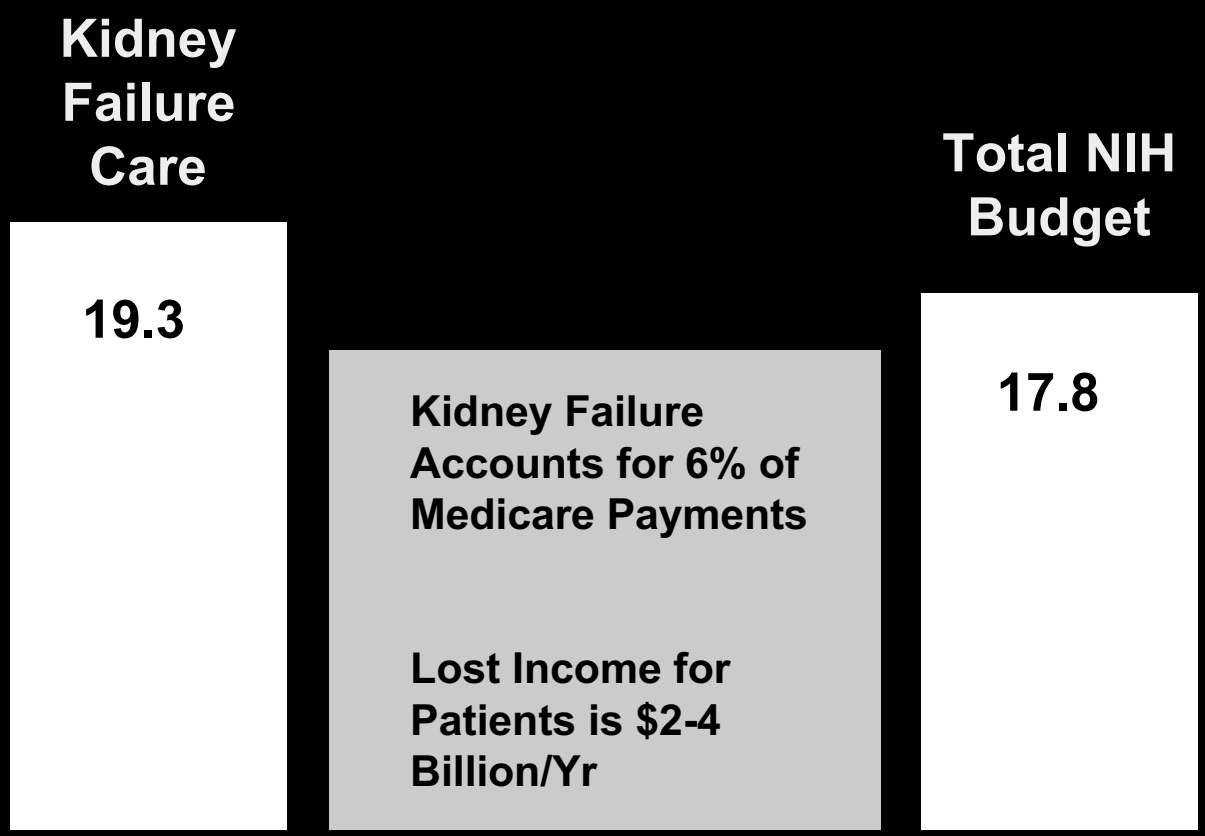
# Costs of Kidney Failure are High
## (in $billions for 2000)




USRDS, 2001

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# CVD is Linked to CKD

- Risk of CVD is increased 1.4 – 2.05 times with creatinine >1.4 – 1.5 mg/dl
- Risk of CVD is increased 1.5 – 3.5 times with microalbuminuria
- Annual mortality from CVD is increased 10 – 100 times with kidney failure
- First year CVD mortality (17%) is 5 times kidney failure incidence (3.5%) after diagnosis of CKD + diabetes

Flack, et al., 1993; Levey, et al., 1998; Jensen, et al., 2000; Ruilope, et al., 2001; Gerstein, et al., 2001; Collins, et al., 2003

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# Treatment to Prevent Progression of CKD to Kidney Failure

- Intensive glycemic control lessens progression from microalbuminuria in type 1 diabetes
  - DCCT, 1993
- Antihypertensive therapy with ACE Inhibitors lessens proteinuria and progression
  - Giatras, et al., 1997
  - Psait, et al., 2000
  - Jafar, et al., 2001

  } **Meta-Analyses**
- Low protein diets lessen progression
  - Fouque, et al., 1992
  - Pedrini, et al., 1996
  - Kasiske, et al., 1998

  } **Meta-Analyses**

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# CKD is Not Being Recognized or Treated

- Most practices screen fewer than 10% of their Medicare patients with diabetes
- Patients are referred late to a nephrologist, especially African-American men
- Less than 1/3 of people with identified CKD get an ACE Inhibitor

McClellan, et al., 2003; Kinchen, et al., 2002; McClellan et al.,1997

# Is "System Level" Action Necessary?

- Universal medical coverage?
- Disease management teams?
- Improved reimbursement for prevention?
- Other?

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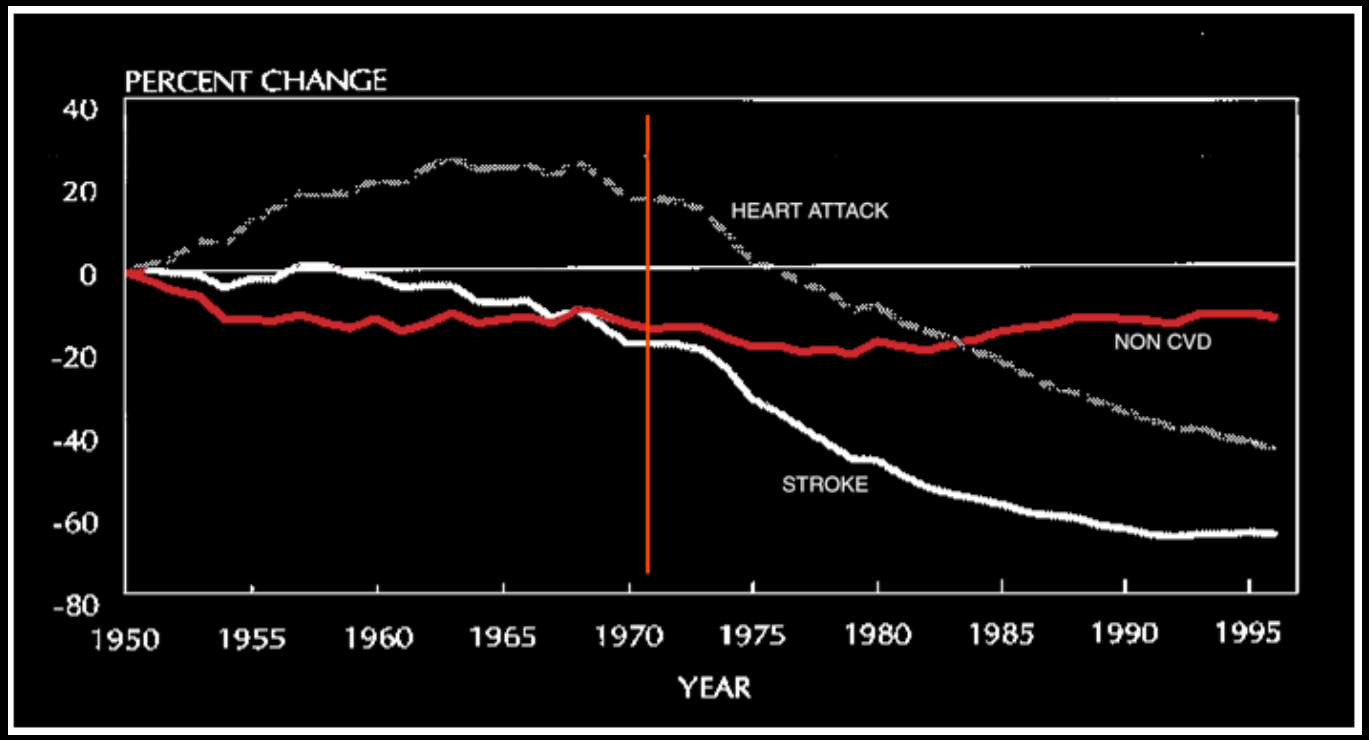
# Age-Adjusted Cardiovascular Death is Declining



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# Parallels Between Hypertension in 1972 and Kidney Disease in 2003

- Recent documentation of effective therapy
- Treatment of a silent disease to reduce risk for a disastrous outcome
- Simple screening
- Advantages for patients, physicians, industry

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# Who to Test for Chronic Kidney Disease

Regular testing of people at risk

- Diabetes
- Hypertension
- Relative with kidney failure

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# How to Test for Chronic Kidney Disease

- "Spot" urine albumin to creatinine ratio
- Estimate GFR from serum creatinine using the MDRD prediction equation

*Note:*

*24 hour urine collections are NOT needed*
*Diabetics: should be tested once a year*
*Others at risk: less frequently as long as normal*

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# Who Should be Treated for Chronic Kidney Disease

- Diabetics with urine albumin/creatinine ratios more than 30mg albumin/1 gram creatinine
- Non-diabetics with urine albumin/creatinine ratios more than 300mg albumin/1 gram creatinine

**or**

- Non-diabetics with estimated GFR less than 60 mL/min/1.73 $m^2$

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# How to Treat for Chronic Kidney Disease

- Maintain blood pressure less than 130/80 mm Hg
- Use an ACE Inhibitor or ARB
- More than one drug is usually required and a diuretic should be part of the regimen

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# How to Treat for Chronic Kidney Disease
**(continued)**

- Refer to dietician for a reduced protein diet
- Consult a nephrologist early
- Team with the nephrologist for care if GFR is less than 30 mL/min/1.73 $m^2$
- Monitor hemoglobin and phosphorous with treatment as needed
- Treat cardiovascular risk, especially smoking and hypercholesterolemia

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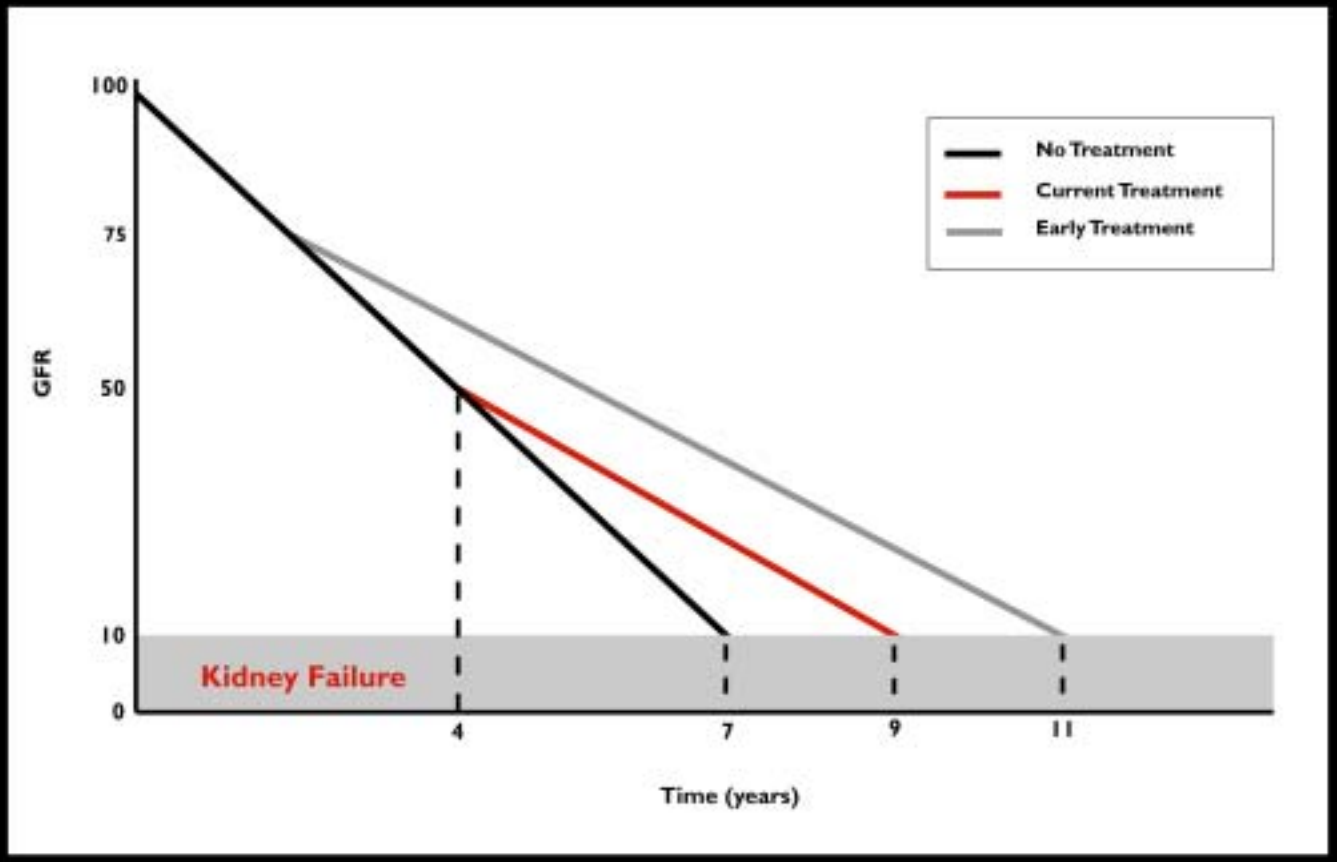
# Early Treatment Makes a Difference




Brenner, et al., 2001

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# Target Audiences

- African Americans with
  - *Hypertension*
  - *Diabetes*
  - *Family history of kidney failure*
- Primary Care Providers

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# NKDEP Activities

- "*You Have The Power To Prevent Kidney Disease*" awareness campaign
- Improved laboratory measurements and reporting of kidney function
- CKD quality indicators among Medicare beneficiaries hospitalized for cardiovascular disease
- Consult letter template for nephrologists
- Working with other non-profit, industry, and government groups

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# PCP Must be Engaged

1) 7.6 million people with GFR 30-60 mL/min/1.73 $m^2$

2) About 5,000 full-time nephrologists

3) Nearly 1,500 new patients per nephrologist

Therefore, 7 new patients per day per nephrologist.

Obviously not possible.

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# What can Primary Care Providers do?

- Recognize who is at risk
- Provide testing and treatment
- Encourage labs to provide and report estimated GFR and spot urine albumin/creatinine ratios

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# You Have The Power To Prevent Kidney Disease

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